

ORAL HYGIENE

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for DENTISTS

Edited by
GEORGE EDWIN HUNT, M.D., D.D.S.

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ORAL HYGIENE

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AS WE SOW

AN ALLEGORY

By DR. E. J. LEONARD, Derby, Conn.

Allegorical characters: JUSTICE, TRUTH, INDUSTRY, HEALTH, HYGIENE, DISEASE and DEATH.

Other characters: A doctor and a nurse.

Scene 1.—A dark compartment adjoining the room of a sick man. Six figures are seated around a table, *Justice* presiding at the end.

Enter *Truth*, late as usual, who takes a seat at the right of *Justice*.

TRUTH. We must to business. Our servant, the doctor, has already arrived.

JUSTICE (Pounding gavel). I will first hear from *Hygiene*, whose word I know is also the word of *Health*. What sayest thou, *Hygiene*?

HYGIENE. I am not a friend of the subject, sir. He has rarely invoked my aid in keeping his mouth and throat—points where *Disease* sent his agents—in a good fighting condition. And when my friend the dentist introduced me to him, he only laughed and turned away. Is it not so, *Truth*?

TRUTH. It is.

JUSTICE (Making a mark on a book). I will hear from *Industry*. Didst thou know the subject, *Industry*?

INDUSTRY. We were friendly, sir; but he would always turn away when I'd whisper the name of *Hygiene*. I have often shown him that such was the means of meeting with *Health*.

JUSTICE (Addressing *Health*). Then thou didst not know the subject, *Health*?

HEALTH. But very little, sir. He wanted my friendship, of course, but he would not seek it. And not being a friend to *Hygiene*, he could never be a friend to me. Is it not so, *Truth*?

TRUTH. It is.

JUSTICE (Marking on the book). You may now suomit your testimony, *Disease*. What sayest thou?

DISEASE. The subject belongs to me, sir! For months have my agents thrived in the decay of his teeth; and when chance presents itself enter his food and so reach his blood.

But neither have my cohorts of indigestion been idle; helped by *General Decay* they have made fine inroads upon the forces of poor old *Health*. Dost thou deny it, *Health*?

HEALTH. I have nothing to say.

DEATH (Arising). I crave audience, sir.

JUSTICE. It is granted.

DEATH. The subject should come to me, sir; for by courting *Disease* he has courted me. *Health* and *Hygiene* may delay the time, sir, but I am inevitable. What say you, *Truth*?

TRUTH. It is so.

JUSTICE (After conferring a while with *Truth*). The decision in the case is this: the subject shall be given into the hands of *Disease*. After *Disease* has completed her work, then may *Death* claim her toll. My decision is final.

Industry, Health and Hygiene arise solemnly and file out of the room into the street; *Disease* and *Death* enter the sick chamber.

Scene 2.—Hall adjoining the sick room. A doctor, leaving sick room, encounters a nurse.

DOCTOR (Addressing nurse). I have left instructions for you within. But the case is hopeless—surroundings very unhygienic. No wonder he contracted tuberculosis! (Exeunt.)

THE PART THE TEETH PLAY IN DISEASE

By C. E. MONTGOMERY, M.D.

City Health Officer and School Inspector, Walla Walla, Wash.

An examination of the mouths of several hundred school children reveals some startling things to one interested in the prevention of disease and the betterment of the race. It is surprising to note

the evident conception that many very intelligent people have in regard to the care and use of the mouth. It has been long thought of merely as a gateway to heave food through to appease the appe-

tite of an empty stomach, and by many it receives no other attention.

Fastidious people rightly complain of decomposing animal and vegetable matter in the street or alley, where at best it can only contaminate an infinitesimal part of the great universe surrounding it, while in their mouths they will have from one to eight teeth full of decaying meat and vegetables sometimes weeks old, with additional fragments lodged between many of the other teeth, the total bulk constituting almost a teaspoonful of fetid matter in a very limited space. Here the ratio of contamination is infinitely greater, and not only is the air of the cavity contaminated, but they are actually mixing this decomposing mass with all the food and drink they take.

Let us see what this has to do with disease. Every one has the idea that decomposing animal and vegetable matter at least aids many diseases to propagate, and that the products of decomposed meat and vegetables are unhealthful, if not actually poisonous, and in this conclusion they are in the main correct.

The teeth are covered with a hard pearly substance called enamel. This substance remains hard and smooth in the alkaline saliva of the mouth, but it is softened by acids if they are held too long in contact with the enamel. The decomposition of starch and sugar foods generates acid, which in turn dissolves and

softens the enamel and leads to the decay of the tooth; then a cavity is formed from which more acid exudes from the decomposing food contained therein. In addition to this meats decompose in the warm, moist cavities and the putrefaction generates offensive odors that permeate the mouth and breath and furnish ideal developing fields for germs of all varieties. It is true many of these germs are relatively harmless and only aid in putrefaction, the product of which is swallowed together with countless numbers of the germs. The saliva is filled with the overflow from these cups of decomposing masses of germ laden material and bathes the tongue, tonsils, throat and stomach with a more or less concentrated solution of live germs in a media of putrefied substances.

The tonsils are often veritable sponges taking up to their capacity this poisonous material, and by means of their connection with the lymphatic system this effluvia is discharged into the blood of the individual and must pass through the entire system in order to reach the great filtering organs, there to be removed.

It is a well known fact that the great majority of the communicable diseases enter the system through the mouth and nose. If these orifices are in a healthy condition the germ that would develop into disease is detained and destroyed by the healthy body defenses, while on the other hand if

these orifices are giving off effluvia from decomposition within, the germs at once begin development just as the seed that falls into the gardener's hot bed. Here the first germs develop into myriads which constitute an invading army attacking at a vulnerable point, and the body is invaded often to its remotest recesses.

Some diseases, such as diphtheria and scarlet fever, produce local inflammation greatest at the point of entrance, and from that point give off concentrated poisons to the blood stream to bathe all the delicate cells of the body.

Measles, scarlet fever and mumps all gain entrance by the mouth or nose, and from these cavities invade the blood stream through the tonsils or adenoids or unhealthy spaces adjacent to the mouth saturated with decomposition products. The eruptions of these diseases can be seen in the mouth and throat many hours before the systemic saturation had become sufficient to show elsewhere.

For this reason it is imperative to examine the mouths and throats of school children if any degree of perfection is attained in the control of contagious diseases. In those recovering from a contagious disease each tooth cavity is a cupful of culture media for the disease germs to reside in until such time as they are deposited on some object to await another hot bed in another dirty mouth.

Besides the diseases classed ordinarily as epidemic there are many that attack the individual solely because some vulnerable point is easily accessible, as an unhealthy mouth.

The painful inflammatory rheumatism with its accompanying heart lesions, is an infection that without doubt gains entrance to the system through an unhealthy mouth or a tonsil diseased as a result of an unhealthy and filthy mouth. Tonsilitis is of frequent occurrence in throats that are dirty. La grippe is an infection that gains entrance by the mouth and nose and its severity is greatly augmented and increased if its germs are furnished with a hotbed of decayed matter held in the cavities of carious teeth.

The irritation caused by diseased teeth produces ulceration of the tongue and lips, and the prolonged irritation of the ulcer often results in cancer in the mouth and its adjacent cavities, and besides this the large amount of germ laden saliva, with its load of putrefying food from cavities in the mouth, is swallowed and produces irritation as well as inflammation of the stomach lining, which is often an invitation for the development of a cancerous process.

There is great need of educating parents to the necessity of having all carious teeth of children filled until the temporary ones are replaced by the permanent.

The temporary teeth should

remain in their places to aid in shaping the jaw, and unless the cavities are filled the temporary teeth cannot form the desired wedges, and to say

the least, it is filthy to allow them to remain as cups full of decomposing food while they are serving their designed purpose.

THE INFLUENCE OF THE TEETH IN THE MAKING OF A CITIZEN

By BESSIE BURNS BENNETT, D.D.S., Baltimore, Md.

The world to-day, in every branch of its activities, needs men, (and women, too) such as the poet described:

"Who, if he rise to station of command,
Rises by open terms, or else retire,
And in himself profess his own desire.
Who comprehends his trust and to the same
Keeps faithful with a singleness of aim,
And therefore does not stoop nor lie in wait,
For wealth, or honors, or for worldly state."

Kind of Men. And what sort of men are those who are willing to crucify self?

Generally clean, big-souled men, who see things from the broad viewpoint of the needs of the world, not through the ineffective ego; who are willing to sacrifice self on the altar of humanity. They are men who have been trained in clean thinking, generally the sons of good mothers, and generally they are men of abounding health, which balances and

stimulates the mental and moral activities.

What constitutes Health? It is a condition of the body, in which *all* the functions are performed with regularity and harmony; a condition in which rich, pure blood, flows through organs, and tissues, and glands and muscles, that vibrate with the life, and yield of the force they receive from that current.

Influence of Health. For the citizen of tomorrow, we must begin with the child of to-day. No child can grow in grace, mentally, or stature, with a body that is only half-nourished, crying out for sustenance; organs seeking to do full work on half fuel, mind trying to grow and develop with almost nothing to grow and develop on.

Many a child has begun his downward career in crime for this very reason. The mind, poorly nourished by reason of impoverished blood, is unable to comprehend what is required of it; the child becomes the joke

of his fellow-pupils and the black sheep of the class; the teacher, in ignorance, of course, of existing conditions, rates him for stubbornness, or inattention or incapability, when the real cause was starvation, mental to be sure, and so less evident to an inexperienced observer, but none the less starvation.

Possible Consequences of the Starved Brain. The child repeats his class, is ranked with children much younger than himself, and continues to be pushed and driven and nagged. Maybe he repeats a second time, and to save himself the unpleasantness of school hours, he plays truant, runs the streets during school session, becomes conversant with street life, and being of the impressionable age, he readily copies the ways of those with whom he comes in contact, learns the beginning of the alphabet of crime, and sometimes continues until he becomes the full-fledged criminal serving in the State Prison.

Strain to Keep Up. Or, the poor little mite may be thoroughly conscientious; he may wonder why it is he cannot keep up with his fellows; he may try with all his power to do his best, keep on trying, and to the effort add worry, which, added to his bodily and mental condition, will cause an excessive nervous strain, coming, as it does, at a time when the body should be en-

tirely free from any such influence, as every part is already sufficiently taxed by complying with the growing demands of each of its many components.

Effects of Nervousness. So we have not only an aenemic body and a dull mind but a nervousness that is pitiful to see in one so young, for we must always see the future man or woman in the present child. The child lacks control, and by mistaken sympathy, the parents often exercise no authority over the little one, and it grows up, accustomed, on account of "nerves," to have its own will and way in regard to everything.

If these children are girls, they are surely poorly prepared to be the mothers of another generation; if they are boys, as men, if they cannot control their own desires, surely they will not be worthy to control the affairs of others. So, here, is citizenship robbed of its own.

The Quitter. Or another result of the starved brain is the quitter. The child sees no use of being the butt of jokes, sees that he is gaining little or no knowledge, and reasons that there are employments that can be entered into with a very meagre education. So he hangs on, under the compulsory education law, until he is of the age at which he is allowed to work, or if there is no compulsory education law, he begins work when it

pleases him, and goes into the world deprived of the greatest asset the individual can possess, education. Certainly if the divine fire is in him he will succeed anyway; many a "self-made" man began life with only the rudiments, but, generally speaking, the illiterate enter occupations in which they can progress only so far, and there they stop, with no likelihood of bettering themselves.

Brain Dynamics. What is it then that brings about the opposite of the dull brain, that gives it the impetus to work, expand, develop, originate; to uplift the race by finding out great truths or discovering great cures or making great inventions?

What makes the body strong and healthy, able to assist the brain in its great achievements because of its unfailing reservoir of motive power?

To both of these the answer is, blood—good, rich, pure blood.

Whence comes the blood? It is the result of digestion properly performed.

On what do the alimentary organs perform that function?

The Food. And, to reach the basis of our reasoning, what prepares the food, so that it may be well digested, and later, assimilated?

The Teeth! Yes, the teeth; on the teeth depend physical well-being, mental attainment, and life itself,

and especially is this true during childhood; the formative age, where every function of the body depends upon the nourishment it receives, to reach out and up to the highest development, upon which development depends the character of the individual citizenship, and the part this may play in the great drama of life.

There are those who may be tempted to stop right here, and exclaim—"Pshaw! The idea of teeth having anything to do with the character of an individual!" Have patience just a little while, and follow the evolution of facts, then honestly admit the truth.

Mastication. Nature supplies the child with a masticator apparatus, which is enlarged and improved as more solid food is taken. With this the child is supposed to chew his food until it becomes like thick cream. This chewing process has three results; first, it reduces the food to the form which the stomach demands, to do its work well; second, as long as the food is in the mouth the gastric cells of the stomach are stimulated to secrete, and so when the mass is finally passed into the stomach there is a large working force ready to receive it; third, it gives to the facial muscles the exercise which Nature intends them to have, and so rounds out and adds beauty to the countenance, as well as assists in the ex-

ercise of the muscles of the nasal tract.

People laugh at Fletcher when he says "chew the food until it swallows itself, *without* the aid of liquids other than the saliva." They joke and say that were Americans to follow out this advice their money piles would lessen, for most of the time would be spent at the table. Well, this is because the jokers do not fully understand Mr. Fletcher's meaning. One can *chew* intelligently as well as perform other duties intelligently, and if we endeavor to taste each atom of food which enters the mouth, it will be found surprising how soon the food is reduced to the creamy mass, and how quickly it *really* does swallow itself. If the food is nutritious and properly masticated, the stomach, under ordinary conditions, performs its function well, and the body is supplied with good, life giving blood.

If mastication, by reason of aching teeth, or other dental ailments, is only half performed, what happens? The food stays in the mouth but a second, and is washed down with a copious drink of some liquid; the stomach must try to do its own work and that of the teeth, too; but, since the gastric glands have had almost no stimulation to secrete, double work must be done by a force which is much below par.

Digestive Disorders. For a time the organ battles bravely to do the double work, all the time growing weaker and more diseased, until finally we have all the varieties of gastric disorders; the child suffers from headache, indigestion, becomes listless, and loses weight; vision and hearing are impaired; the breath is bad; and if this passing on to the stomach of unmasticated food continues, cancer has been known to develop later from the continued irritation of the delicate lining membrane.

In sympathy with the ill-treated stomach, and by reason of poor food supply, the nervous system is involved and the child develops into that horror of the 20th century, a neurasthenic. If the conditions progress until the kidneys be affected, we have further ills, with Bright's disease among the list.

Brain Supply. Since the brain must live by blood, it too often is robbed of nourishment, and the crying evils of the starved brain, which have been already mentioned, make their appearance.

Tuberculosis. Tuberculosis is the greatest scourge of the present day, and rheumatism is another. To combat with the former millions are spent annually, hospitals erected for its treatment, scholarships endowed for its study, district nurses employed for didactic measures among the poor and ignorant, open air schools built where tubercular children may study and at the same

time have the benefit of fresh air, and yet, with all these combative and preventive measures, the gaunt white reaper still claims thousands for its own, and the municipality is robbed of those who might have become Samsons in their ability.

Here again the teeth wield their influence in neglected mouths, where the cavities of decay hold putrid debris, where the tartar is teeming with bacteria of all degrees of virulence, where pus discharges from abscessed roots helps to make of the whole a poisonous collection, an injection of a drop of which would kill any animal.

In such a mouth we have about six square feet of surface covered with filth, such filth that if it were exposed anywhere on the person of the child, or on the school-room floor, for instance, would cause parents to raise a protest. As it is it is hidden, and the public is not supposed to know anything about it. But this is a case where ignorance spells danger, and it is the duty of the public to inform itself on the subject; for in every dirty mouth lurks tuberculosis, both for the owner of the mouth, and everyone he comes in contact with.

Mouth Breathing. The secretions of an unclean mouth are always exceedingly acid. This acid medium, flowing back into the pharynx, causes irritation; the tissues become inflamed

and swollen, and in many instances, the adenoid growth results. The enlargement of tissues and the growth obstruct the nasal passage to such an extent that breathing through the nose becomes impossible and the individual becomes a mouth breather, the nasal passages atrophy and grow small and attenuated, the face showing the change.

Just as mouth breathing progresses, the nasal tissues atrophy so such an extent, that if the mouth breathing continues for any length of time, it will be found that the nasal tract has become so small in calibre that the individual must exercise it, just as would be necessary with the limb which has not been used for months and months. These conditions sometimes occur, not always from oral causes, as early as three or four years of age, and if not alleviated the child is dwarfed in every developmental aspect; even his face, by means of the disease and unnatural position of the facial muscles brought about by mouth breathing, bears the stamp of the condition by an expression closely resembling imbecility. The tense position of the powerful buccal muscles drives in the jaw teeth, causes anterior protrusion and narrows the arch, thus encroaching on nasal space. Naturally the teeth are crowded, irregularities result and mastication well performed is an impossibility, to say nothing of the extremely unpleasant expression of mouth and face.

When air is breathed through the mouth it is neither warmed, nor filtered, nor cleansed, as happens when it passes through the nose where the little hairs lining the nostrils destroy many of the bacteria, the sieve like bones filter it of much of the dust, and in its slow passage it becomes of the temperature of the blood before reaching the lungs.

Mouth breathed air is also much less in quantity than that taken in through the tract provided by Nature.

Deterioration of Lungs. In mouth breathers lungs do not need all their working tissue, so they gradually atrophy, and the blood in its passage through the pulmonary tract not only does not receive a full supply of oxygen, which every tissue of the blood demands, but it is given many impurities breathed in through the mouth.

So, the medium whose duty it is to sustain life being already impoverished by hampered digestion, is again robbed of vitality by mouth breathing.

The habitual mouth-breathing person presents a thin chest and round shoulders, and the lungs, already undermined as has been shown, are cramped in such an unnatural position that even in their smaller calibre they can not be fully inflated.

Lack of Resistive Power. Suppose this individual takes a heavy cold or comes in contact with the dried sputa of a tubercular patient or some of the tubercle bacilli in the di-

versified collection in his own mouth find lodgment in the attenuated lungs; in either event the first lesion is made, the disease becomes established, and with the impoverished blood supply and resultant lowered vitality the power of resistance is nil and the patient either succumbs at once to the disease, or partially recovering, drags his weary, invalid way through life till death finally does bring a blessed relief.

Not only is this true of tuberculosis, but of almost any infection to which the individual may be exposed.

Rheumatism. Rheumatism is another present day scourge. Visit the hospitals, alms houses and homes, and it will be found that a large per cent of the disease is rheumatic. Up to a short time ago medical authority agreed that the cause of rheumatism was too much free acid in the blood. This theory seems to have given place to one that the germs of rheumatism can be traced to the debris which lodges in the soft folds of tonsilar tissue, for which reason many surgeons advocate the removal of the tonsils upon the slightest provocation.

If the new theory be true, many a case of rheumatism may thank a neglected mouth for its origin, for it is only from an unclean oral cavity that much debris could come to lodge in any portion of the naso-pharyngeal tract, for, when the mouth is given its thrice daily bath, followed by a thorough rinsing and gargle,

but little remains to be deposited.

Infection. Not only does an unclean mouth militate against efficient citizenship in the individual, but take the budding citizens in a school, and one child with a dirty mouth may by scattered germs infect numbers of children in his direct vicinity by ordinary breathing; or he can spread his bacteria ten feet by sneezing, or coughing.

So, since the need for good citizens is such an imperative one, since health contributes so largely to individual attainment, mentality and morals, which constitute the good citizen, and since the dragons that guard the gate to health are the teeth, and upon their care or neglect depends the nutriment of the body, is it not time that the public be awakened to their woeful state of ignorance, an ignorance which is far from bliss, but which brings about evils, beginning with disease and ending with death.

Yes, the public should awake and see that all children have the benefit of dental treatment. Every school district should have a dental examiner who would keep parents informed, and each section of the city should have a clinic where work would be done for the needy, gratis. This is not an unexploited

statement. Many cities in the United States have dental examiners for the schools. A few have clinics. Two school clinics doing good work are Rochester and Baltimore.

In Baltimore an experiment is being tried at the Parental School, Waverly. These children are renegades and live at the school for the term for which they are committed. The clinic has been in operation now for over a year, and the superintendent is more than enthusiastic over the work. He says the boys are improved in every way, and the school board is so impressed by results that they have decided to establish a clinic at another school near the central, congested, poorer section of the city, which, it is more than probable, will be supplied with patients from among all the needy school children of the city.

So, if by actual experiment well-cared for teeth benefit a child in health, in mental capacity, in the power to gain for himself a place in the world, are we not making of him a better citizen? Phillips Brooks says: "He who helps a child, helps humanity with a distinctiveness, with an immediateness, which no other help given to human creatures in any other stage of their human life can give."

A foul mouth and decaying teeth, particularly in children, decidedly increase the chances of catching con-

tagious and infectious diseases, as scarlet fever, diphtheria, measles, and tuberculosis.

TOOTH TALKS

By R. A. TATE, D.D.S., Coffeyville, Kans.

The Teeth are the Gateway to Health.

An Unclean mouth is not a thing of Beauty, nor should it last forever. The purchase of a Good Tooth Brush may not signify a Start on the Road to Wealth, but it certainly does mean a Start on the Road to Health.

The Teeth should not be used for a Universal Nutcracker, said cracker can be Bought at the Hardware Store for a Nominal Price.

The Teeth were not originally constructed for the purpose of Cutting Thread, notwithstanding the fact that a Great Many of the Fairer Sex are trying to prove Daily that this assertion is not founded on Fact.

The Teeth are of Great assistance in cutting and Grinding Food before swallowing, yet a great many People, that have carelessly acquired the Eating Habit, Bolt their Food down daily in apparent fear that it might get acquainted with their Teeth; or to solve the Riddle: Chew your food Thoroughly.

Brushing of the Teeth is as Essential and a great many times more Beneficial than the daily washing of the Human Mug.

A Failure to wash the Teeth, after the Habit is fully established, leaves your Teeth feeling about as Fresh and

Comfortable as the Absence of a Good Face Washing for the same length of time as the age of the Historic Coon.

With the present Mania for passing all kinds of laws in the Various States, None as yet have been passed preventing the use of the Tooth Brush, so feel Free along this line.

The Baby's First Tooth is a source of great rejoicing in the home, yet this famous tooth which was miraculously pushed through the gums has a duty to perform and should be taken care of with this end in View.

This Famous Tooth, which easily becomes Infamous if allowed to decay into the Nerve, should be polished daily by the mother with a small Flannel Cloth wrapped around the index finger moistened with a weak solution of common soda.

The Baby's Teeth, as has been said before, are inserted for a purpose and not for the Exclusive use of papa's finger to see how hard the smartest-child - I-ever-saw-at-his - age can bite, and these Teeth should be brushed with a small soft brush instead of a cloth after two or more teeth have risen above their gummy surroundings.

Extracting a Tooth just because it is Aching is along the same line of thought that if you have a Boil on your

Finger you cut off that Offending Member.

Just because "pa, ma and Uncle Bill and Aunt Sarah" and a few Other Worthies, either singly or collectively, lived to be "Seventy Odd Years" and "never had a Decayed Tooth in their heads," which assertions, by the way, usually compare with some of Baron Munchausen's Lively Tales, yet granting these Hoary old Jokes to be true, this in nowise signifies that you have a Gilt Edge Guarantee of Good Teeth, unless you care for them as all Good Teeth Would like to be Cared For.

Bad Teeth go Hand in Hand; have you a pair of Hands of this nature?

Gritty Substances should seldom be used on the Teeth. Breathing through the Mouth helps to form that unsightly, unhealthy and unsanitary Collection found near and under the Gums commonly called Tartar.

A little pinch of Alum in Water used once a week will greatly assist in the Reduction of this Tartar formation.

A Decayed Tooth among Sound ones compares favorably with the results caused

There are ten million school children in the United States suffering from the direct effect of decaying teeth and unsanitary mouths

Is your child among them?

Proper care of the mouth and teeth is one of the most important of all the meas-

ures that are taken for the protection of the human body, and failure to give them care is, in my judgment, the direct cause of more disease in the human family than any other single cause.—Major W. O. Owen, M. D., Surgeon United States Army.

Just because you have brushed your teeth Thoroughly is no Sign that School is Out and you can go Home, for you have another Task to perform. Use a Silk Ligature between your Teeth and you will remove Substances that your Brush never even had an Introduction to.

Remember that Good Teeth are a Business Asset as well as Good Clothes

When you take your child to the Dentist for Professional Services do not tell the child that it will Not Hurt, for by so doing you do both yourself and the child, as well as the Dentist, an Injury; and, anyway, the child may later ask you if you are an active member of the Ananias Club in Good Standing, with all the Privileges, etc.

You should use the utmost Care in selecting your Dentist and should not be governed by the Prices Charged but select one in whom you have Confidence, a man of Recognized Ability and one with an All-Wool-Dyed-In-The-Yarn Conscience.

MOUTH HYGIENE AND BACKWARD CHILDREN

By J. E. WALLACE WALLIN, Ph.D.

Director of Psychological Clinic, University of Pittsburgh. Director of Psychological Research to the Oral Hygiene Committee of the National Dental Association, 1910-11

My interest in the oral hygiene movement springs largely from my interest in race melioration and conservation. There are two fundamental methods by means of which we shall be able to conserve the best interests of the race:

(1) By improving breeding, or eugenical mating. This is the more important of the two classes of measures, but it is likewise the more difficult to put into practical operation. We cannot escape the fact that there is a very wide chasm between theoretical and practical eugenics.

(2) By improved bringing up, or the efficient control of euthenical factors. Among these factors I include not only improved methods of child training and education, but also improved hygienic and sanitary nurture and corrective and remedial care. While the problem is essentially one of prevention rather than one of cure, we cannot blind ourselves to the existence of defects already established but must proceed to correct or remove these.

Now, there is a general conviction that the application of the above two classes of preventives and corrective measures will improve the bi-

ological capital of the race, and thus make race melioration. Among other things, there are those who believe that by the removal of the physical handicaps which afflict our children we shall be able to elevate not only their health standard, but also their mental standard. This is a question in which I have taken considerable interest for a number of years. I have been particularly interested in obtaining demonstrated or demonstrable facts which would either prove or disprove the claim that the removal of physical handicaps will increase the mental efficiency of school children; for, fundamentally, in a state of civilization we cannot hope to fashion a higher type of humanity without elevating the mental index of childhood—not, to be sure, at the expense of the body—for success in a state of civilized society depends more on strength of mental action than on force of muscular power.

In looking through the literature, however, I found little direct or incontrovertible evidence that the mentality of school children could be elevated by correcting physical defects (I am not

now speaking of diseases). To this general statement there is one conspicuous exception, namely: thyroid treatment in the case of cretins or persons suffering from thyroid insufficiency. To be sure, there were numerous observations on record of the marvelous improvement made in individual instances from proper nose, throat, eye and ear treatment, particularly to the improvement resulting from the removal of adenoids. But this was not what I wanted. Instead of observation and opinion, I wanted *experimental evidence of a quantitative nature*. But there was no such evidence available; no attempt had been made to measure by definite controlled objective tests the degree of mental improvement resulting from the correction of various kinds of physical handicaps. The nearest approach to such an investigation was the gross statistical study made by the Russell Sage Foundation of the retarding force of various physical defects. The Foundation found that the normal child (assuredly the child without physical defects, though very few such children exist) required a given amount of time to finish a certain number of the elementary grades. It then ascertained the amount of time required to finish those same grades by various types of physically defective children, and concluded that the average physically defective child required 8.8 per cent. more

time to finish the grades in question (the loss for children having teeth defects amounted to 5.9 per cent). These gross statistical studies, while, to be sure, they have a considerable suggestiveness, do not possess very much scientific value because of the fact that it is impossible to determine precisely the nature of the defects which are being measured in these statistical surveys. They offer no control of conditions. Children suffering from one kind of defect very often simultaneously suffer from a number of other defects. The method is particularly defective because it *makes no attempt to measure the improvement which actually follows the correction of any kind of physical defect*.

Some such considerations as the above led me to undertake an experimental inquiry, by which I hoped to measure by controlled objective tests the influence of the removal of physical defects on the working capacity of school children. It seemed to me that the best point of attack for such an investigation was the diseased and unhygienic cavity of the mouth, for two reasons: first, because there is no disease of childhood which is so prevalent as dental caries; in fact this defect is so common that it has been appropriately called "the disease of the people;" second, because, in accordance with the statement accredited to Osler, "There is not any one single thing more important in the whole range of hygiene

than the hygiene of the mouth." Accordingly I suggested to the then chairman of the Oral Hygiene Committee of the National Dental Association that a series of psychological tests be carried out on a squad of school children suffering from very bad conditions of the mouth, with a view to arrive at a definite objective impersonal measurement of the orthophrenic effects which must be assumed to follow the application of various oral hygienic measures. It was arranged to put twenty-seven boys and girls in the Marion Elementary School of Cleveland, Ohio, through a thorough course in oral hygiene, which consisted not only in the carpentry of the teeth (that is, the filling of tooth cavities, extraction of decayed roots and polishing of teeth), but also in teaching children proper mouth sanitation and thorough mastication of food. A nurse was employed to train these children, both in the school and in the home, to properly brush their teeth, harden their gums and to masticate their food. In order to measure the mental improvement which might result from the application of this scheme of oral treatment, it was necessary to devise a series of psychological tests so arranged that they would correctly measure such improvement. It was, therefore, necessary to conduct a series of successive tests, all of which would be equal in difficulty, and a series of five such tests were constructed.

These tests included the capacity to memorize three place digits, the rapidity of writing free word associates opposite supplied antecedents (rapidity of thought), the rapidity of writing antonyms opposite a series of supplied key words, the ability to add one-place digits arranged in columns of ten figures, and the ability to draw a stroke through the A's that were distributed promiscuously in successive lines of capitals. These tests thus served to measure the influence of proper mouth treatment on the strength of memory, the power of spontaneous and controlled associations, the ability to add and the rapidity of perception. Each of these five tests was arranged in a series of six successive tests equal in difficulty. Two sittings were held before any treatment was given the children, and the remaining four sittings were conducted during the course of the treatment or after its conclusion. The averages of the scores in the two sittings before treatment thus gives the *normal* standard of performance for these children, and the difference between the average of these two sittings and the average of the last four, or the average of the last two, indicates the amount of improvement made by the children in the course of the experimental year, which extended from May, 1910, to May, 1911.

The complete description of this experiment may be found in the following papers: Ex-

perimental Oral Euthenics, *Dental Cosmos*, Philadelphia, April and May, 1912; Experimental Oral Orthogenics, *The Journal of Philosophy, Psychology and Scientific Methods*, New York, May 23, 1912; Aspects of Infant and Child Orthogenesis, *Psychological Clinic*, Philadelphia, November 15, 1912; Methods of Measuring the Orthophrenic Effects of the Correction of Physical Handicaps, *Proceedings of the National Association for the Study and Care of Exceptional Children*, Plainfield, New Jersey, 1912. The test blanks, with instructions for their administration, are now for sale by C. H. Stoelting Co., 121 N. Green St., Chicago. Here there is time merely to point out in the briefest manner the most general results.

The amount of average improvement in the various tests was as follows: In ability to memorize, 19 per cent.; in spontaneous association, 42 per cent.; in adding, 35 per cent.; in associating antonyms, 129 per cent.; and in the capacity to perceive, attend, and react, 60 per cent. The average improvement in all the tests thus amounts to about 57 per cent.—truly a very significant gain. Even if we concede that one-half this gain—and that is, I believe, a sufficiently liberal concession—is due to a number of extrinsic factors, such as familiarity, practice and increased maturity, the gain solely attributable to the

heightened mentation resulting from the physical improvement of the pupils would still be very considerable. There is corroborative evidence to show that there was a general improvement in the mental functioning of these pupils. This evidence is supplied by the examination of the pedagogical records of scholarship, attendance and deportment. Most of the members of this experimental squad were pedagogically retarded in their school work from one to four years, but during the experimental year only one pupil failed of promotion, while six did thirty-eight weeks of work in twenty-four weeks and one boy finished two years of work within the experimental year. During the preceding year many pupils were quite irregular in their attendance owing to toothache, bodily indispositions, irritability or distaste for school work, and five pupils were obliged to carry truancy cards; but during the experimental year the attendance was materially improved, the cases of truancy entirely disappeared, while certain boys considered formerly as incorrigible now established new records for deportment.

No phase of the modern child conservation movement merits deeper scientific study than the relation between the normal, physical, mental and pedagogical development of school children and a community plan of physical and mental orthogenesis. The results which we have arrived

at in this experiment by controlled objective quantity methods emphasizes anew the paramount importance of teaching the pupils in our schools proper dental prophylaxis and supplying free dental treatment in the schools to all certified indigent cases. It should be specially emphasized that owing to the enormous number of children suffering from diseased teeth, it is not sufficient merely to establish school dental clinics. There are not enough dentists in any community to treat the teeth of all the children who have oral defects. It is, therefore, imperatively necessary that the work of dental hygiene be so organized on a community basis that children may be systematically *taught to care for their teeth and sanitize their mouths* from the day that, as members of the schools, they become wards of the state or of the community.

Among the fruits which would accrue from the introduction of mouth hygiene instruction and the establishment of dental clinics in the schools may be mentioned the following:

1. *Value to the afflicted pupils themselves.* Dental hygiene is a means of ridding the suffering pupil from the exciting cause of pain, disease, mental stagnation, moral deviation and irregular school attendance. It is one of the effective means available for raising the child's actual efficiency a little nearer to its maximal potential. Dental

hygiene is a God-send to the individual child.

2. *Benefits the school system.* Dental hygiene is one of a number of effective means of combatting the evils of pedagogical retardation, repetition, elimination, non-attendance and delinquency. It is a practical means of increasing the efficiency of the school system.

3. *Financial value to the taxpayers.* The greater the return on the investment, the cheaper will be the cost of maintaining the schools; and, obviously, the more proficient the pupils are, the greater will be the returns on the investment. In terms of dollars and cents, the annual saving in any school system would amount to a very considerable sum. For example, let us assume that those pupils who suffer from the very worst mouth conditions would improve only 15 per cent. in working efficiency as a result of the application of a judicious system of mouth hygiene. This is a very conservative estimate; the improvement would probably be at least above 25 per cent. Now let us assume that at least 20 per cent. of the 65,000 pupils enrolled in the elementary schools of Pittsburgh suffer from very bad oral conditions, and that these pupils are in such impoverished circumstances financially that they would not obtain any dental treatment unless school clinics were established. The approximate cost of *instruction* for the elementary pupils

in the public schools of Pittsburgh amounts to \$30.00 per year, therefore if each of these 13,000 pupils gained 15 per cent. in working efficiency as a result of dental treatment there would accrue a saving of \$4.50 per year for each one of these pupils, or \$58,000.00 a year for these 13,000 cases. This estimate, however, probably fails to do full justice to the benefits to be derived, because it is an undoubted fact that a very large number of this group of children who suffer from very bad dental conditions would fail in their school work and thus have to be educated at least twice in the same grade. That would mean an additional cost of \$30.00 per year for every repeater. Dental treatment would save very many of these cases from failure to make their grade, and thus save the cost of repetition to the taxpayer.

4. *Benefits accruing to race conservation.* Dental hygiene will improve the mental and physical health of the individual child, and this, in time, will lay the basis not only for a more efficient citizenship,

but also for a more efficient parenthood; for by elevating the health index of children we shall not only increase the health, happiness and productive capacity of adults but also elevate the genic or reproductive index of the race. The application of the best *euthenical* principles of race melioration will probably also produce the highest *eugenical* results. This argument is perhaps one of the strongest arguments for developing community plans of child orthogenesis. (Elsewhere I have indicated that there are two fundamental aspects to a program of race orthogenesis, namely: orthoprenics and orthosomatics. See Individual and Group Efficiency, Psychological Bulletin, Baltimore, Oct., 1912.) Our most sacred duty is to the race, to posterity. Most of what we have we owe to our ancestry and the best that we possess we should strive to bequeath to our posterity; and the most precious gift which we can bestow upon posterity is a normal health progeny and an uncontaminated heredity.

A great handicap in tuberculosis is defective teeth, which make it impossible to properly masticate and assimilate sufficient food for the body to throw off the disease. A well nourished body is of the first importance in the prevention and treatment of the Great White Plague.

Forty per cent of the absentees from school are caused by toothache. It has been shown that children with decaying teeth are six months longer in completing the eight common school grades than are the children with clean mouths and sound teeth.

Would it not pay to take care of the children's teeth?

A PLEA FOR THE FIRST PERMANENT MOLAR

By EDWARD BUMGARDNER, D.D.S., Lawrence, Kansas

Nature provides us with two sets of teeth, twenty deciduous teeth for use during childhood, and a permanent

Before absorption begins the roots of the deciduous teeth are as long, in proportion, as those of the permanent teeth.



Figure 1.

set of thirty-two for the rest of our lives. A child five years of age has five teeth on each side of each jaw. (Figure 1 is from a photograph of the upper jaw of a child of five.) Beginning at the middle line in front, the deciduous teeth are named: central incisor, lateral incisor, cuspid, first molar and second molar. These twenty teeth make the deciduous set complete; they are destined to be replaced in a few years by twenty of the teeth of the permanent set. About the age of four the roots of the deciduous teeth begin to decalcify, or absorb.

These roots gradually become shorter as absorption takes place, the teeth loosen, and at about seven years of age the first ones of this set are shed and replaced by permanent teeth. The deciduous incisors and cuspids are replaced by permanent teeth of the same form and name, but the spaces occupied by the first and second deciduous molars are taken by the first and second bi-cuspids. A period of about four years is required for the shedding of the deciduous teeth and the eruption of the corresponding permanent teeth, so that the last of the

deciduous teeth are replaced at about eleven years of age.

But at the age of six, before any of the deciduous teeth have been shed, a large grinder erupts behind the second molar. This is the first permanent molar, and if it is lost

any of the teeth can be urged with special propriety in favor of this one. The extraction of no other tooth is liable to interfere so greatly with mastication or to produce so many evils. When we remember that it is situated in the part



Figure 2.



Figure 3.

it will never be replaced. The first permanent molar is the largest tooth of either set; it has the longest period of usefulness; and being the most valuable of all, its preservation is very essential. All of the reasons for preserving

of the jaw where the greatest extent of growth should take place, we can understand how its early extraction may interrupt a proper development of the jaw and cause irregularity of the permanent teeth. Figure 2 shows a typical case of

malposition of the permanent teeth produced by the loss of this one. Nature has attempted to close up the space by tilting the second and third permanent molars forward, with the result here illustrated. Many people think that because there may be but little space in after years between the second bicuspid and the second molar, the loss of the first molar has been of little consequence. No greater mistake could be made. When the second and third molars lean forward as they do in Figure 2 only the back cusps can come in contact with the teeth in the opposite jaw, and their masticating value has been almost destroyed. Usually there is also a contraction of the jaw from side to side which produces a V-shaped arch and interferes with articulation. In fact, the loss of the first permanent molar is one of the most frequent causes of irregularity in the permanent arch. The fact that parents generally do not recognize this as a permanent tooth makes its preservation one of the most difficult problems in dental hygiene. Every dentist has had mothers argue with him that this is a "first tooth;" that it cannot be a permanent tooth because no first tooth was shed before this came in; and therefore it is not such an important matter to preserve it. A comparison of Figure 3 with Figure 1 will show the relation of this tooth to the deciduous teeth. Figure 1, taken at five

years of age, shows all the deciduous teeth in position. Figure 3 is from a photograph of the same mouth taken at seven years of age. None of the deciduous teeth have been shed, yet the first permanent molar is erupted.

It is a mistaken idea, however, that the deciduous teeth may be neglected with impunity. There are various reasons why they should receive as scrupulous attention as the permanent teeth. In the first place, they are needed, for the

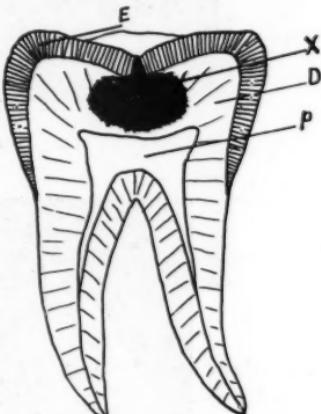


Figure 4. E, enamel; D, dentine; P, pulp, or "nerve;" X, cavity of decay.

growing child requires an abundance of properly masticated food. If they are allowed to decay the delicate pulps become exposed, lose their vitality, decompose and cause painful and poisonous abscesses. Many other reasons could be given why every precaution should be taken to preserve the deciduous teeth. *But the sixth year molar is a permanent tooth.*

It should be preserved by all means. Unfortunately, it is peculiarly liable to decay. It apparently decays earlier than the second permanent molar, because it has been in use six years when the latter is erupted. The diseases of infancy frequently leave their traces in imperfect tooth development, especially in the enamel of this tooth. A perfectly formed molar has on the grinding surface several cusps separated by rounded grooves. In the development of the enamel, calcification begins at the top of these cusps and continues till they are joined at the grooves. Too often the development is imperfect at the union of these enamel domes, leaving a fissure instead of a groove. In these fissures minute particles of food lodge, and we have the old story of dental decay—decomposition of food, the formation of an acid, dissolution of the lime salts of which the tooth is composed, a cavity. Though it never begins to decay until the enamel has been penetrated, dentine is softer and decays much more rapidly than enamel. For this reason decay is always insidious, but never more so than in the first permanent molar. This can be appreciated by reference to

Figure 4, which represents a section through the middle of a lower molar. It is a common thing to find this tooth reduced to a mere shell in the mouth of a child only ten or twelve years of age. Even then there may be no pain until the pulp is exposed, or the undermined enamel is broken, when the tooth may be too far gone to be saved by filling. It is the unconscious, though almost universal, neglect of this tooth that makes dentists regard it as one of the most difficult to save. If it receives the proper attention from the time of its eruption, it can nearly always be saved until old age. In most cases it will require some attention from the dentist in order to be retained during its normal long period of usefulness. Parents, you will not be blameless if your boy or girl is maimed by the loss of this tooth. Ignorance on your part will not excuse you. Those who have made a professional study of the subject are willing to instruct you. Do not wait for the child to complain of toothache, but, soon after his tooth has erupted, let it be examined by a competent and conscientious dentist, and trust him as to what is best for it and for your child.

A clean mouth will do much to prevent tubercle bacilli from gaining a foothold in the body.—Henry G. Langworthy, M. D.

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sound natural teeth is about two hundred and fifty pounds.

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TO OUR REGULAR READERS

This is the month for the Laity number, but this is not the Laity edition. After this edition is off the press, all this advertising in the back will be lifted out and replaced with reading matter. The Laity edition will contain seventy-four or more pages of reading matter, written for and adapted to lay readers. I believe you will like the Laity edition. If you do not, it really is your own fault, for you were urged to write something for it. But good or bad, with all its virtues and faults, it now is, and if that be treason make the most of it.

WHAT A DENTAL NURSE THINKS ABOUT IT

By DYMPLE B. JOHNSON, Ft. Smith, Arkansas

Following are some suggestions which every one can understand and act upon to help along the cause of oral hygiene, by observing real courtesy in a dental office:

1. Get a good night's sleep before hand.

2. Wash your hair and dress it simply.

3. Brush your teeth.

4. Take a bath and wear all clean clothes.

5. Wear clothes with a loose collar.

6. *Don't say any of the following things. They are not original with you:*

"Oh, I'm so nervous."

"I'd rather do anything else than have my teeth worked on."

"Will it hurt?"

"Oh, I just *hate* to have that thing buzzing around in my head."

"Do you suppose I'll get

another crown in heaven?"

7. Don't blow about the care you take of your teeth. You wouldn't have to visit the dentist if you really used that care, you know.

8. A dentist's capital is his time; don't be a petty thief and steal it by telling him long winded yarns about the teeth in your family. If he needs any personal history to aid him in diagnosing the case, be assured he knows enough to ask about it. If he doesn't, go to another dentist.

9. Remember the eye teeth are not connected with the eyes and the stomach are not connected with the stomach.

10. Give at least twenty-four hours' notice or *keep* your appointment.

11. The dentist really is a human being, and the more consideration you show him the better work you'll get.

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Listerine is truly prophylactic, in that it exercises an inhibitory action upon the acid-forming bacteria of the mouth, and assists in maintaining through natural means, the alkaline condition so necessary for the welfare of the teeth.

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A TOILET OF THE MOUTH

By GEORGE EDWIN HUNT, M.D., D.D.S., Indianapolis, Ind.
Dean of Indiana Dental College and Editor of Oral Hygiene.

"For fools rush in where angels fear to tread."
Pope's Essay on Criticism.

I approach the task of telling you how to avoid a dirty mouth with both fear and trembling. While all mouth hygienists are agreed that a clean mouth will retard and diminish decay of teeth, even if it does not absolutely prevent it, and will conserve the general health and probably prevent the occurrence of many highly dangerous and deadly infectious diseases and diseases due to faulty nutrition, when it comes to the concrete act of telling us the correct technic for getting and maintaining a clean mouth, no two of them will agree on the details. Therefore, I approach this task with the aforesaid fear and trembling and warn you in advance, gentle reader, that your favorite dentist is just as apt to tell you that my advice is all wrong and following it will result in dire disaster, as he is to tell you it is all right. Personally, I think it is all right. Of course I do or I would not give it to you, and so, "since the fool doth think he is wise," let us on to the end.

In the first place, it requires different degrees of effort to keep different mouths clean and free from decay. Where the teeth are

perfectly formed, and set in the arch in perfect manner, it is much easier to clean them than it is if they are not so formed and so set. I do not propose to carry you through a learned disquisition on dental topics, but will simply suggest to you that as some people are tall and some are short, some are lean and some are fat, some have physical defects — cross eyes, bald heads, a drooping shoulder, and things like that—and others have not, so the teeth of different individuals vary. And as your teeth depart from the normal, ideal standard, so will you have to exercise greater skill and attention in keeping them properly cleansed. If you have crowns or bridges in your mouth, or partial plates, or badly finished fillings or inlays — fillings or inlays with bad margins—eternal vigilance only will be the price of freedom from trouble.

The first thing to do, when you decide to put your mouth in order, is to go to a good conscientious dentist and have him do what is necessary—and pay him for it. If he is a good dentist and a conscientious one, he will fill any cav-

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ties in your teeth that they may have, will go over the margins of all fillings to see that they are smooth, will remove every vestige of "tartar" and stain, will treat and cure your gums if they are diseased and will dismiss you with a clean, healthy mouth. It is then your privilege and duty to keep it so.

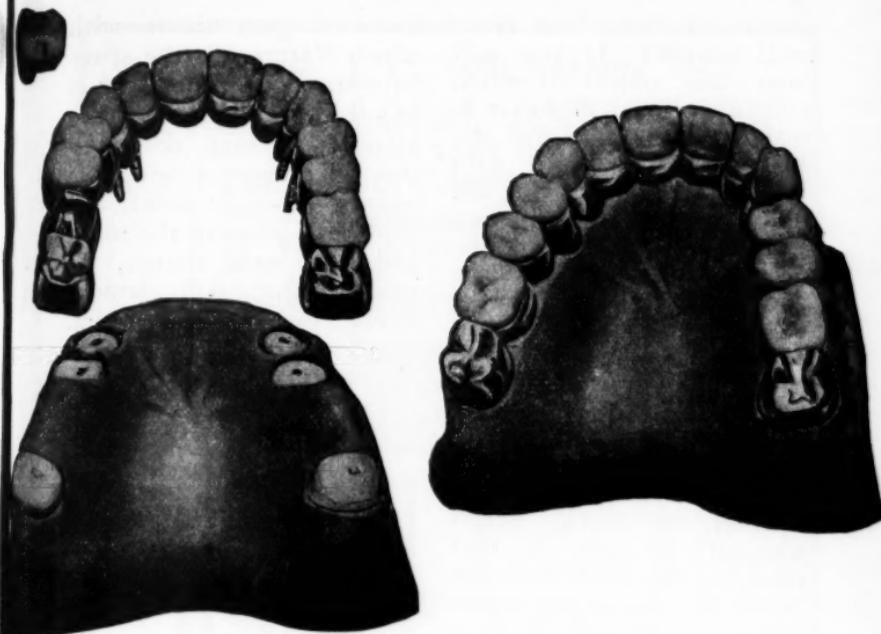
Now where in the twenty-four hours shall I start? Suppose we begin with the beginning of your day—when you arise, and right here is where I stump my toe, according to many good dentists. In my opinion, all that is necessary for you to do on arising is to rinse out the mouth thoroughly with either plain water or, better still, lime water. Take the liquid into the mouth and rush it back and forth between and around the teeth, by the action of the cheeks and tongue. You know how. Just as you used to do it after mother gave you castor oil or other equally palatable doses. Now, many good men will tell you you should use your tooth brush before breakfast and I have no objections to offer to your doing so if you will follow the remainder of my technic, but I know there is a limit to the amount of time and energy you will expend on your mouth and if you will do the things I advise you to do at night, the rinsing in the morning will be all that is necessary. And after you

have done it a few mornings you are thereafter no more likely to omit it than you are to omit washing your face.

This seems a good chance to talk about mouth washes. Do not use mouth washes unless told to do so by your dentist. No mouth wash will kill all the germs in your mouth and if it did it might not be desirable and furthermore, if it did, your mouth would be full of germs again in an hour. The mucous membrane lining the mouth does not need to be antisepticized, unless it is diseased, any more than the mucous membrane lining the stomach. It is the same lining. No physician would advise you to swallow mouth washes several times daily to antisepticize your stomach, so why do that for your mouth?

After breakfast, clean your mouth. And I suppose this is a good place to tell you how to do it.

Use the waxed, floss silk dental thread first. That good, conscientious dentist of yours can teach you more about the use of the thread in ten minutes than I can by printed words and pictures in thrice the time, so I will not attempt a minute description of its use at all. Certain hints, however, may be helpful. The object in using the thread is to clear food and mucus from those surfaces of the tooth that can not be reached by the tooth brush and for this



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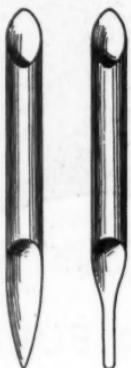
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purpose nothing else is so well adapted. If you will bear this object in mind, common sense will go far to teach you how to use the thread. Do not start with too short a piece or you will find it everlastingly slipping through your fingers, to the detriment of your patience and your temper. Have it long enough so you can wrap it around one finger on each hand, for certainty of holding. As it passes the "tight point" between your teeth, do not permit it to snap down hard on the gum between the teeth. When you hit the gum in that manner, the gum becomes "irritated," just as you would become "irritated" if some one should hit you on the nose. Pass the thread twice between each two teeth, holding the fingers so the thread will sweep the surface of one tooth one time and the surface of the other tooth the other time. Do not forget that there is a back surface to the last back tooth in your mouth and that it needs cleaning with the thread—and with the brush—just as the back steps and back porch in your house needs cleaning the same as the front ones. After having removed all particles of food with the thread, brush your teeth. But before coming to that permit me to say something about toothpicks.

The thread is better than a toothpick, as it is less likely to injure the tender little

mass of gum tissue with which Nature fills the space between teeth in perfect mouths. The thread, if not allowed to snap down on this bit of gum tissue after passing the tight point, will slip down between the tooth and the soft tissues, as your dentist will demonstrate to you if you ask him. Furthermore, the thread cleans the surface of the



Figures 1 and 2.

tooth better than a toothpick just as a rag, or other soft substance, will cleanse an uneven surface better than a board or other inflexible object.

If you insist on using a toothpick, however, I would avoid the wooden ones. The very cheap wooden picks are liable to splinter and injure the gums by pricking them. The higher priced, round, firm wooden picks are not so likely to splinter, but any wooden pick will injure that tender gum tissue between the teeth on ac-

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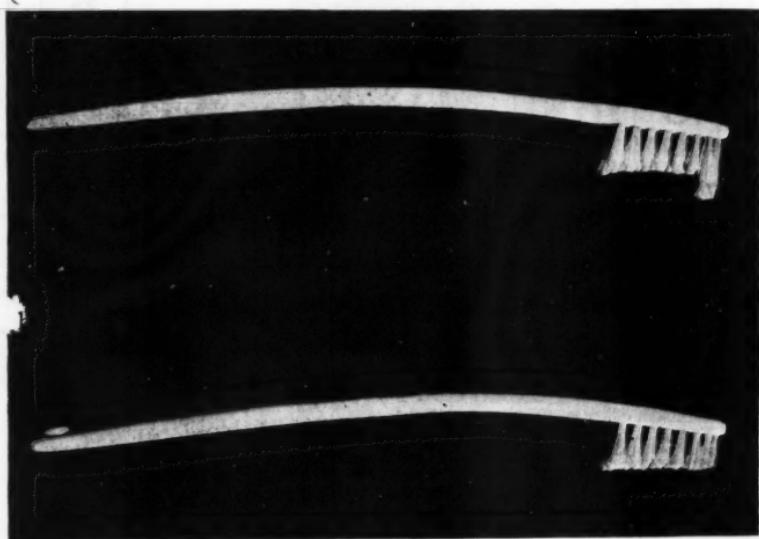
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count of the bulk of the pick. The tooth pick least likely to injure the gums is a quill pick properly shaped with a pen knife. Figure one shows the common quill pick of commerce, as you buy it or get it on the railroad dining car. A penknife will readily pare it down to a thin, flat, flexible working point which is as nearly innocuous as any

do the bathers on the beach. Some of the handles are straight, some are crescent shaped and some are crescent shape reversed. Some have the bristle bunches set closely together and others have them far apart. Some have the bristle portion two inches or more in length and on others it is only an inch or less. Some have the cleansing surface



Figures 3 and 4. A little over half size.

pick can be. The invention is my own, but I give it to you freely. Figure two shows the pick prepared for use. Now in regard to brushing the teeth.

I have no idea how many varieties of tooth brushes there are in the world, but certainly they are legion. They range in price from five to seventy-five cents, or more, and vary in form as

flat and level, some have it concave, some have it convex, and some flat in its greater extent, but with a tuft of bristles on the end. Can it be that all of these are correct or perchance may all of them be wrong? "Tell it not in Gath; publish it not in the streets of Askelon," but I believe a normal set of teeth may be kept clean with almost any

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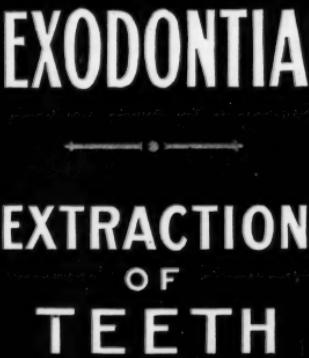
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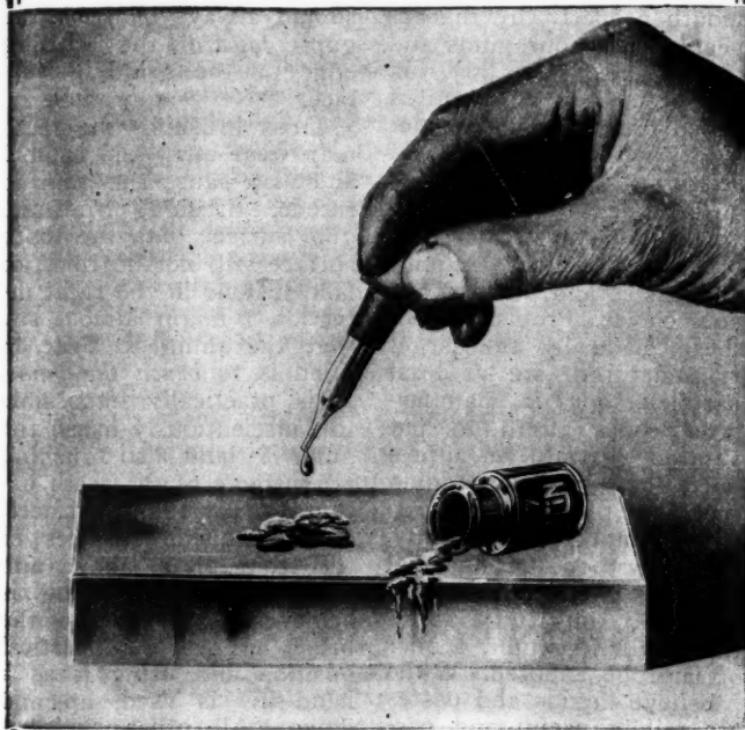


of these numerous forms of brushes, but there are some forms that will render the task easier for you and therefore they are better. In the first place it seems sweet reasonableness to believe that you can get a small brush between the cheek and the back teeth easier than you can a large one. Certainly it would be more difficult to cleanse those surfaces if you were to attempt it with a scrubbing brush, so I think it fair to assume that the small brush is more apt to reach the remote places than a larger one and I would, therefore, select a brush with the cleansing surface in the neighborhood of an inch in length and without much "breadth of beam." Furthermore, if you will take the first finger of your right hand and pass it to the back teeth, next the cheek, you will find the finger naturally crooks a little to enable you to rest the ball of it against the last tooth. If this is so, does it not seem reasonable to assume that a brush with a slight concavity in the handle will enable you to more easily reach those back teeth? Remember, the front teeth are generally easily reached and that it is the back ones that require the greatest amount of skill to properly cleanse. Furthermore, a brush with the bundles of bristles set close together is certainly less apt to permit the bristles to pass in between the teeth than

one with the bundles of bristles set farther apart, to say nothing of the close set bundles of bristles making the brush more difficult to keep clean and sanitary. So I would select a brush with not too many rows of bristles, say from six to nine small or from four to six large bundles of bristles lengthwise and from three to four small or two to three large bundles cross-wise. Do not buy tooth brushes by the pound or yard. This is one of the cases where it pays to get only a little of a good thing for your money.

That leaves only one point of much importance about your brush to discuss—the shape of the cleansing surface. Standing before the mirror with your mouth wide open, you can see that a brush with a tuft of bristles on the extreme end, as in figure three, will reach the back surface of the back tooth, as well as many other surfaces, with greater ease than you could reach them without that tuft. So, for that reason, such a brush would seem to be a good shape. However, some people have such large jaws and such tense, stiff, thick cheek muscles that this kind of brush cannot reach the surfaces of the back teeth next to the cheek and a brush with the bristles shorter at the tip end than anywhere else, is best for them. See figure four. I would say that the tufted

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end brush is best in the most of cases, but advise you to follow the suggestions of your dentist in the matter. Your dentist can also tell you whether you are reaching all portions of your mouth properly, by the appearance of your gums and teeth. And, by the way, you can easily change a tufted ended brush to one without a tuft with a small pair of scissors.

The next question is, what shall you use on your brush? There are liquids and pastes and powders for your choice. Probably all of these made by the larger manufacturers are at least harmless, for no manufacturer could afford to put anything harmful in a product that he is spending scores of thousands of dollars to induce you to buy. His only hope of financial gain lies in having you re-buy and re-buy and a harmful dentifrice would sooner or later be exposed. While I believe liquids and pastes are mildly useful and partially cleansing, a good powder will do much better work in removing foreign matter on the teeth. And if used dry, on a dry brush, its scouring effects are at their best. However, they scour also when moist.

If you wish to use the powder dry, put as much as you please, and a trial or two will tell you how much, in a dry glass and charge your brush from that, repeating the charge as neces-

sary. Since any powder remaining in the glass must be thrown away, it is well to note how much is needed for one cleansing.

The movement of the brush, in brushing the teeth, should always be *from* the gum *toward* the cutting edge or the grinding surface.

Cross brushing the teeth may wear away the enamel and may cause the gum to recede. Brushing from the gum surface onto the tooth surface will not do this. In fact, if done in the right direction I might almost say that the thing to bear in mind is to *brush the gums*. It is practically impossible to conscientiously brush the gums without also brushing all surfaces of the teeth except the grinding surfaces. On the inside surfaces of the front teeth, above and below, proper brushing is achieved by holding the brush in nearly a vertical position and using it as a hand-saw is used, up and down. All other surfaces, except the grinding surfaces, should be brushed with a rolling motion of the brush, just such a rolling motion as the rolling-pin has in rolling out the biscuit dough. For the outside surfaces, place the front teeth end to end, or even leave them slightly separated, and use the brush with the rolling motion, brushing from as high up on the gums as the brush can be placed, onto the tooth surfaces. Use

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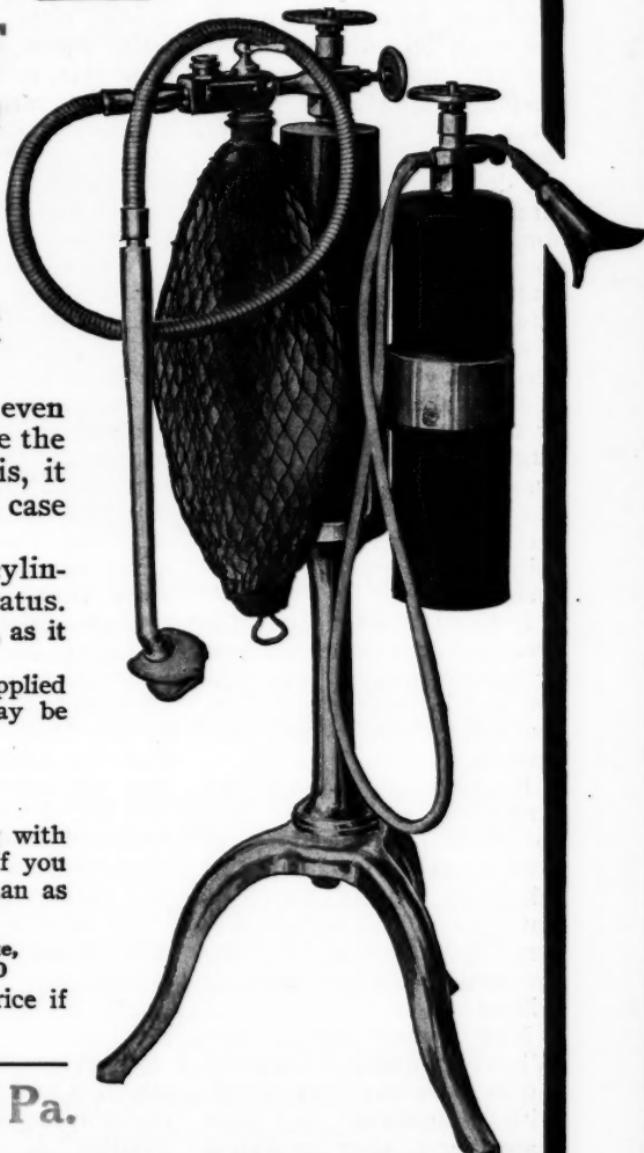
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the same methods on the inside surfaces, with the mouth widely opened. Next brush the grinding surfaces freely and vigorously in all directions. How much and how long you should brush the teeth depends on the individual mouth. If you are keeping your teeth free from stain and your gums and teeth free from disease, you are doing all that can be desired. Lastly, stick out your tongue and brush the whole top of it thoroughly. If you want to see what accumulates on your tongue scrape it with a dull table knife and see what you get.

Now take some plain water and rinse the mouth thoroughly, passing the water—*squirting* it is the word that fits the case—between the teeth vigorously. And the toilet of the mouth is complete.

If there is a tendency for your gums to either congest or become anemic, your dentist will instruct you how to massage them with your fingers.

Reading the above instructions may cause you to think the cleaning of your mouth is a tedious and laborious process, but it is not. If you will have a system about doing it, the amount of time it takes is trifling.

Now where were we? When you arise you are going to rinse out your mouth with lime-water or plain water, and after breakfast clean the mouth as de-

scribed above. What you do after your noon day meal depends on circumstances. If you can do so, cleansing the mouth again is desirable, but if this is not practicable, rinse the mouth out with water. I have even done this, at the end of the noon-day meal, with coffee, milk, or ice-tea, to the horror of my wife. You will not need a tooth pick if your dentist has done his full duty.

If you desire, cleanse the mouth after the evening meal. Certainly you should rinse it. And now we come to the other one time when cleansing the mouth is important, namely, just before retiring. Never fail to devote sufficient time to giving the mouth a thorough cleansing the last thing at night and it is well to always finish the toilet by rinsing with milk of magnesia or lime water. The hours of sleep are the most favorable for fermentation of the food in the mouth, with its consequent formation of acids which form cavities, so it is highly necessary that the mouth and teeth be thoroughly cleansed just before retiring.

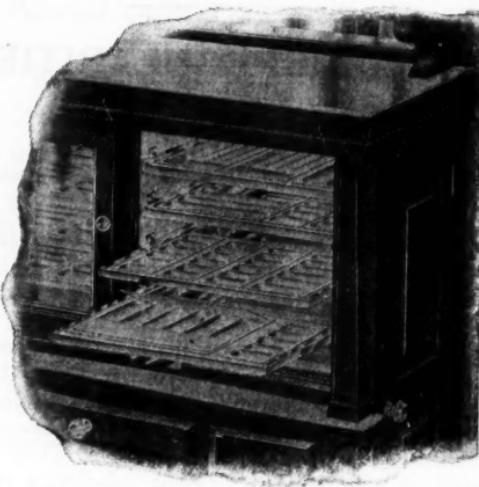
To sum up. If you are only going to cleanse the mouth once in twenty-four hours, let it be just before retiring.

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water, lime-water, or milk of magnesia; clean the mouth after breakfast; rinse the mouth with plain water, lime-water, or milk of magnesia after the noon and evening meals; cleanse the

mouth and rinse with lime-water or milk of magnesia just before retiring.

And the very best you can possibly accomplish is to clean the mouth any time you eat anything.

DENTAL IRREGULARITIES

CAUSES AND PREVENTION

By J. K. KNIGHT, Jr., D. M. D., Boston, Mass.

At the very beginning let us understand that this article is limited to causes and prevention. The treatment of teeth that are already irregular is left to the dental practitioner, but parents commonly wish to know how these deformities are produced, as well as how and to what extent they may be remedied or avoided without spending an unnecessary amount of time in the dentist's chair.

Our first consideration, then, will be the causes of irregularities, after which their prevention will be more easily understood.

It has been said that the three most prolific causes of malocclusion, or incorrect positions of the teeth, are mouth-breathing, lack of attention to the temporary teeth, and thumb-sucking or some similar habit causing unequal pressure on the growing parts of the mouth. While these are not all, they are certainly important enough to be considered very

carefully. To this list of three we will add one more, often disregarded both by dentists and by parents—unnecessary extraction.

Taking these four causes in the order named, we come first to the subject of mouth-breathing. This may be the result of decay of the temporary teeth, enlarged tonsils or adenoids, or imperfect development in the arches of the jaws. This last deformity follows any failure of the bones of the mouth to unite correctly, or a deviation of the septum of the nose.

In a child, decay makes contact of the teeth very painful, and the young patient unconsciously keeps the jaws apart enough to open the lips and soon begins to breathe through the aperture thus formed.

But probably most of our cases of mouth-breathing are produced by adenoids and enlarged tonsils. Adenoids have been known to occur even in a child of three months, and add greatly to

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the irritation of teething. A surgical operation is not always immediately necessary, if there is no obstruction of the air-passages; but if these are closed or narrowed, the defect must be remedied at once, because, if the nose and throat are not clear, the mouth cannot be closed while chewing, and the teeth do not receive use enough to stimulate their proper development. Furthermore, this continual separation of the lips may cause the muscles of the cheeks to exert an undue pressure which will move the teeth out of their correct arch line.

Mouth-breathing also has another evil effect, one that is felt over the whole system. The child with this habit does not keep a large enough proportion of oxygen in the lungs. As a result, nutrition is impaired and the bones are not developed to their full size. So the bones of the face and jaws are too small to receive the teeth that are set into them.

Our second consideration is lack of attention to the temporary teeth, as producing irregularity in the permanent set. This is the case where parents may be considered fully as responsible as the dentist. Parents often neglect these first or "baby" teeth, knowing that others are to follow, and so they are allowed to decay beyond repair. This carelessness may produce irregularities in either of two ways:—First, as already

mentioned, extensive decay causes mouth-breathing with its narrowing of the arches of the mouth and throat; second, decay will so weaken the teeth beyond saving that they have to be extracted too soon. In this second case we may expect any of the following irregularities in the permanent set as a result of premature extraction of the temporary teeth: the space left open will be filled by the teeth crowding from either side before the permanent successor can erupt; when this tooth does appear, it will have to come outside or inside of its correct position in the jaw; being deprived of the protection of the temporary tooth, the permanent one may erupt before it is fully developed and appear as a deformed tooth.

The third common cause of irregularity is the formation of some such habit as sucking the thumb; *very little pressure, if constantly applied, will move a tooth in the line of least resistance.* This is especially true in young children, who are just those most likely to form such habits. Besides thumb-sucking we must watch for such habits as gritting the teeth together, biting the lower lip, drawing the lips in tightly against the teeth, pressing the tongue out against the teeth. All these exert, in some direction, a pressure greater than the normal resistance, so that the arch is made too small or too large for the teeth.

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This cause is one which parents can do at least as much as the dentist to remove. The habit should be early recognized and corrected, by actual physical control over the child, if it can be done in no other way.

We now come to the last of our four most common causes of irregularities, one which is perhaps oftener than any other to be considered the fault of the dentist, unwise extraction. The alveolus, as we call the bony part of the skull which holds the teeth, is affected by the temporary teeth; they act as a sort of wedge, keeping the alveolus spread apart and stimulating its development, so that there will be room for the permanent teeth. Premature extraction in the temporary set removes this stimulus to enlargement of the bone and a contracted arch results. This not only produces irregularity in the positions of the teeth, but also causes the appearance of the features to be marred, sometimes very noticeably. For instance, there may be a sunken expression to the cheek in the region of the cupid or "eye-tooth." Or the narrowing of the jaws will throw the teeth in the front of the mouth forward until they project beyond or over the lips.

Another irregularity to be guarded against is changing the median line of the teeth, which should correspond as nearly as possible to a line drawn down the center of the face. Extracting a per-

manent tooth on one side and leaving the corresponding one on the other side in the mouth is likely to change this median line by producing a tendency for the teeth to move toward the side where one is lost.

Parents often make the mistake of supposing that the first permanent molar, commonly called the "sixth-year molar," is a temporary tooth, because it has had no predecessor, but comes in a space formerly unoccupied. For this reason they let it decay, expecting another to follow, or sometimes even insist on having it extracted. Its value to the set and the harm produced by its loss are seen from the following results, any or all of which may be caused by its extraction:—the adjoining teeth have to do more than their share of work, as this is a powerful grinder; the length of the growing jaw is shortened; by this decrease in length the mouth is made smaller; the failure of the jaw-bone to be fully developed interferes with the growth of the nose and throat tissues, so that mouth-breathing follows.

We are told that extraction as a remedy for malocclusion is never absolutely necessary, seldom advisable. Certainly it causes many improperly formed arches, which some other method might have cured. In the rare cases where extraction of permanent teeth is deemed advisable, corresponding teeth on each side of the jaw

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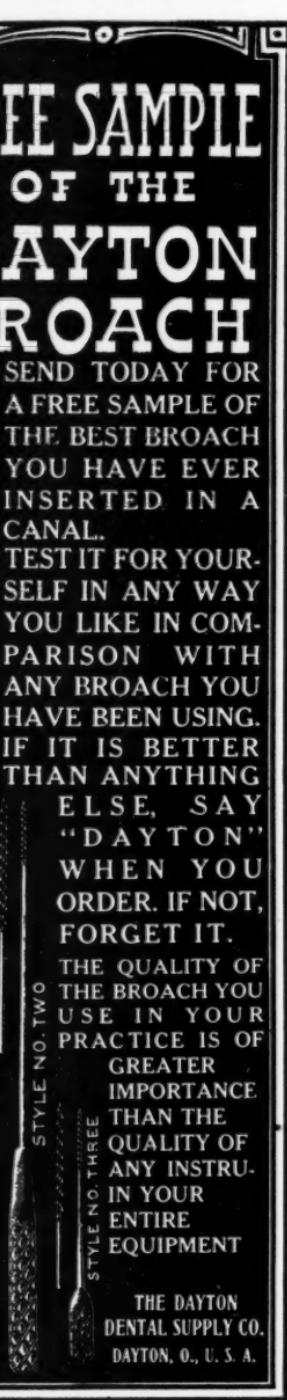
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should be taken out, in order not to disturb the median line.

Besides the four important causes already discussed, there are other factors in the production of irregularities, which we only mention, as being less common or of doubtful influence. Supernumerary teeth are occasionally found in a mouth, forcing the others out of their normal positions; these abnormal teeth should be recognized and extracted as early as possible. A tooth is sometimes twisted or turned in the bone so that it cannot erupt into the mouth. The nutrition and activity of the whole body may be so weakened by a wasting disease like tuberculosis that the roots of the temporary teeth are not properly absorbed, but remain and interfere with the permanent teeth.

Heredity is a factor whose influence in these cases, as in everything else, has been a subject of much discussion. While it is frequently blamed for irregularities, and sometimes no doubt justly, still we probably often forget the influence of environment, as Nature's tendency is back toward the normal through several generations. Our rushed and artificial life; lack of fresh air; food so prepared as to be easily swallowed without proper mastication—these are without doubt in many cases the causes of irregularities which we place to the account of heredity. Still, the persist-

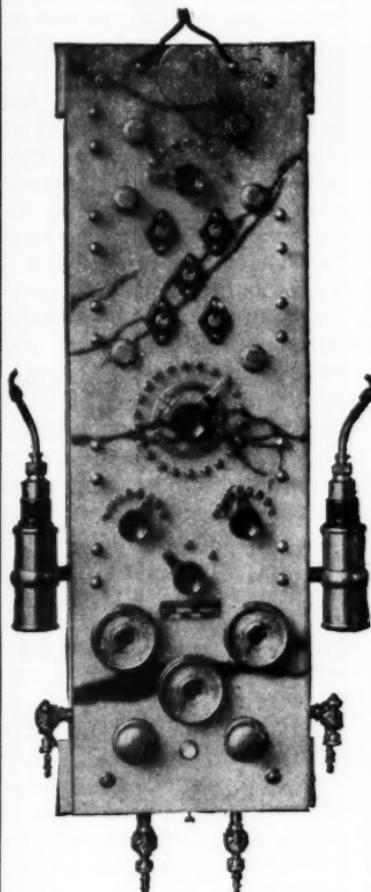
ent lack of a certain tooth, the presence of the large teeth of one parent with the small jaw of the other, or *vice versa*, or the occurrence of some abnormal condition through several generations—all show that heredity does have its influence.

Having thus considered somewhat in detail the causes of irregularities in teeth, we are now better able to see how to remove or avoid them, always remembering that there is no case where the old adage, "An ounce of prevention is worth a pound of cure," can be more aptly applied than in the one under discussion. The results of attention to regularity of the teeth are not confined to these organs alone, but show in the increased symmetry of the facial lines and the harmony of the features.

First, and of the utmost importance, take the case under treatment early. It was formerly said that we should not undertake to regulate until all or most of the permanent teeth had erupted. Now we do not wait for this, but begin as soon as the *tendency* to irregularity appears.

Parents should watch for mouth-breathing in their children, and if this habit is noticed, consult the dentist or throat specialist, or both, immediately. Any obstruction to the air-passages, such as adenoids or enlarged tonsils, must be remedied at once; otherwise the dentist is trying to correct a deform-

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ity without removing its cause. Mouth-breathing must be stopped in order to give the teeth as well as the other parts of the mouth the opportunity for the correct growth and development.

In regard to our second consideration, the care of the temporary teeth, remember that these should be watched as closely as the permanent, and any decay replaced by suitable fillings, up to the time when these teeth should normally be lost to make way for their successors. If for any reason temporary teeth have to be removed before their time, it is advisable, when possible, to preserve the open spaces by some mechanical appliance until the succeeding permanent teeth appear in their places.

The third cause can be removed only by the most patient and constant watchfulness on the part of parents. They should see that their children either do not form or else are broken of such habits as sucking the thumb or biting the lips. The dentist cannot accomplish his work while these habits persist, yet he cannot have his young patients constantly before him; it therefore becomes the duty of the parent to help in this respect.

In regard to extraction, few instructions can be given to parents, as this is a question which must usually be left to the best judgment of the dentist. We may say, however, that every effort should be made to save from

extraction the six front teeth in each jaw, three on either side of the median line, as well as the first permanent, or "sixth-year" molars. If extraction is necessary, be sure that only those teeth are taken out whose loss will not affect the harmony of the facial expression.

This study of the four great causes of irregularity shows plainly that the most necessary element in prevention is watchfulness by the parents, together with regular visits, at least twice a year, to the dentist for thorough examination. Careful, conscientious study of children's cases by the dentist, with constant attention on the part of parents until all the temporary teeth are replaced by their permanent successors, should stop many cases of developing irregularity. Then think of the difference to a child of twelve years, if, instead of having a misshapen mouth with teeth which cannot even chew food correctly, he or she is provided at the start of life with two sets of teeth arranged, as Nature intends them to be, to perform, in the best possible manner, the functions of mastication and articulation, while to the features are imparted the symmetry and regularity which constitute true facial harmony.

More to the Purpose.

"What did you do when he kissed you, holler for help?"

"No, I hollered for witnesses."
—Cleveland Plain Dealer.

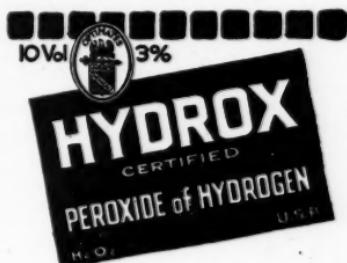
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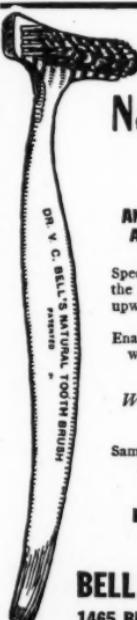


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THE DUEL

The gingham dog and the calico cat
Side by side on the table sat;
'Twas half past twelve, and (what do you think?)
Nor one nor t'other had slept a wink!
The old Dutch clock and the Chinese plate
Appeared to know, as sure as fate,
There was going to be a terrible spat,
(I wasn't there; I simply state
What was told me by the Chinese plate!)

The gingham dog went "bow-wow-wow!"
And the calico cat replied "mee-ow!"
The air was littered in an hour or so,
With bits of gingham and calico,
While the old Dutch clock in the chimney place
Up with its hands before its face.
For it always dreaded a family row!
(Now mind, I'm only telling you
What the old Dutch clock declares is true.)

The Chinese plate looked very blue,
And wailed, "Oh, dear! what shall we do?"
But the gingham dog and the calico cat
Wallowed this way and tumbled that,
Employing every tooth and claw
In the awfulest way you ever saw—
And, oh! how the gingham and calico flew!
(Don't fancy I exaggerate!
I got my news from the Chinese plate.)

Next morning where the two had sat,
They found no trace of dog or cat;
And some folks think unto this day
That burglars stole that pair away!
But the truth about the cat and pup
Is this: They ate each other up!
Now, what do you think of that!
(The old Dutch clock it told me so,
And that is how I came to know!)

—Eugene Field.